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## ABSTRACT

The research reported here examined constructs of field dependent or real-world versus field independent or text-driven modes of instruction. It was argued that the level of pedagogical clinical knowledge and reflective thinking among prospective Afro-American teachers differed not only in mode of instruction but in level of instructional emphasis as well. Two random samples were drawn from two groups of Afro-American preservice teachers (N=183--145 females and 38 males) enrolled in an introductory level education course. A pretest/posttest quasi experimental design was used to examine differences in students' acquisition of selected aspects of clinical knowledge and level of reflective thinking. Findings supported the observation that field dependent instruction involving the analysis of real school events qualitatively influenced prospective teachers' initial cognitive integration of clinical pedagogical knowledge; a positive relationship between reflective thinking and cognitive integration of pedagogical clinical knowledge irrespective of level of instructional emphasis also was confirmed. The major implication of the study is that, in teacher education, a more holistic and flexible approach is required to enable preservice teachers to achieve a more meaningful versus a superficial understanding of teaching. (Author/LL)

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Relationship between Afro-American Preservice Teachers'  
Pedagogical Clinical Knowledge and Reflective Thinking

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## Abstract

Author: Leroy Kemp

Title: Relationship between Afro-American Preservice Teachers' Pedagogical Clinical Knowledge and Reflective Thinking

The research reported here examined the assumption advanced by the multisource learning theorists using constructs of field dependent or real-world versus field independent or text-driven modes of instruction. It was argued that level of pedagogical clinical knowledge and reflective thinking among prospective Afro-American teachers differed with not only mode of instruction but with level of instructional emphasis as well. It was assumed that the cognitive integration of pedagogical clinical knowledge would reveal qualitative differences under real classroom teaching experiences versus text-driven instruction.

Two random samples were drawn from two groups of Afro-American preservice teachers enrolled in an introductory level education course. The combined groups consisted of 183 preservice teachers (145 females and 38 males) enrolled during the fall 1990 and fall 1991 semesters. A pretest/posttest quasi experimental design was used to examine differences in students' acquisition of selected aspects of clinical knowledge and level of reflective thinking among the two samples.

The findings supported the observation that field dependent instruction involving the analysis of real school events qualitatively influenced prospective teachers' initial cognitive integration of clinical pedagogical knowledge. A positive relationship between reflective thinking and cognitive integration of pedagogical clinical knowledge was confirmed irrespective of level of instructional emphasis (moderate versus high). The major implication of this study is that, in teacher education, a more wholistic and flexible approach is required to enable preservice teachers to achieve a more meaningful versus a superficial understanding of teaching.

Relationship between Afro-American Preservice Teachers'  
Pedagogical Clinical Knowledge and Reflective Thinking

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Purpose of the Study

Given the current research relating to studying cognitive changes while learning to teach (Clark, 1988; Ross, 1990; Sparks-Langer & Colton, 1991; Zeichner & Liston, 1987), we have much to learn about preparing new teachers from different cultural heritages how to professionally handle the complexities of unknown classrooms (Education Commission of the States, 1990). The research reported here represents one beginning attempt to systematically look at intellectual changes among Afro-American preservice teachers while they are learning to teach. The purpose of this study was to increase the theoretical and applied knowledge of teacher education by better understanding the nature of growth in pedagogical clinical knowledge and reflective thinking among students from a minority culture.

An Overview of the Problem

There is general agreement that critical reflection and problem solving competencies ought to constitute the essential core of the curriculum in the professional education of prospective teachers (Fenstermacher, 1990; Giroux, 1988; Goodlad, 1990b; Kagan, 1988; Liston & Zeichner, 1987; Morine-Dershimer, 1989; Schon, 1983;

Shavalsen & Stern, 1981; Wildman & Niles, 1987). However, questions remain unanswered as to the nature of the professional practice instrumental in the development of preservice teachers' pedagogical and reflective thinking competence (Hollingsworth, 1989; Schon, 1987; Kemp, 1990).

A major challenge focuses on the methodological and empirical issues related to how prospective teachers acquire, interpret, give meaning to, and make decisions relative to different forms of pedagogical knowledge (Hoffman, 1986; Rosenshine, 1987). According to Hoffman (1986), in addition to curriculum issues, inquiry regarding factors which influence cognitive changes in preservice teachers' learning to teach is necessary to increase our understanding of the professional practice in education.

Schon (1987) argued in favor of a field dependent as opposed to a field independent or laboratory form of professional education of prospective teachers. In theorizing the nature of professional knowledge and education, Schon (1987) stated that complex problems in real-world teaching contexts resist technical solutions. Consequently, learning professional pedagogy in laboratory and field independent class settings appear to overlook aspects of actual teaching events in favor of simpler problems that respond to predetermined responses. According to Schon (1987), learning is a multisource process whereby the education of prospective teachers should begin with

real-world complex problems or some type of situation that is characterized by uncertainty, conflict, and uniqueness.

The multisource process of learning in real-world situations has been generally substantiated by recent developments in cognitive psychology (Iran-Nejad, McKeachie, & Berliner, 1990; Walters & Gardner, 1985). Drawing from Barlett's (1932) construct of simplification by integration and Lewin's (1951) field theory, researchers have advanced the supposition that individuals have the natural potential for learning in real-world situations. Individuals possess the potential for simultaneously integrating multiple sources of information (Ausubel, 1963; Brown, Collins, & Duguid, 1989; Iran-Nejad, 1990; McCombs, 1989; Shuell, 1990).

Pedagogical knowledge acquired in actual teaching events are more readily learned, remembered, and used (Zeichner & Tabachnick, 1981). Such instructional events appear to be more meaningful, the more situated in context, and more rooted in cultural, background, metacognitive, and personal knowledge of prospective teachers (Hollingsworth, 1988; Iran-Nejad, McKeachie, & Berliner, 1990; Wildman & Niles, 1987).

#### Background

Current reforms in teacher education have increasingly focused on preservice teachers' intellectual and reflective thinking competence (Clark & Lampert, 1986; Giroux, 1988; Goodlad, 1990a; Liston & Zeichner, 1990; Schon, 1987;

Shavalsen & Stern, 1981. The major theoretical assumption advanced was that teachers make judgements and carry out decisions in an uncertain complex environment. Thus, prospective teachers require critical pedagogical competence for transforming the diverse realities which have altered the traditional boundaries in public education (Elmore, Rowan, Sykes, Gideonse, Johnson, Raywid, David, & Cohen, 1990; Feathers, 1989; Giroux, 1991; Goodlad & Keating, 1990).

#### Pedagogical Competence and Reflective Thinking

Teaching involves the integration of knowledge, values, and skills (Lortie, 1975; Schon, 1987; Sparks-Langer & Colton, 1991). An understanding of teaching requires preservice teachers to synthesize knowledge of teaching with their personal values systems, unique attitudes, and experiences (Jersild, 1952, 1955; Fuller and Brown, 1975; Clark, 1988). It was assumed that reflective thinking and pedagogical clinical competence are developmental in nature (Ross, 1990). Consequently pedagogical knowledge and reflective thinking should grow as prospective teachers advance in the teacher education program.

#### Cognitive Integration and Intellectual Development in Teaching

Cognitive integration and intellectual development are interrelated and interdependent (Bieri, 1966). In a very broad sense, cognitive integration indicates something about how prospective teachers structure their knowledge of the

complexities involved in teaching. Students' cognitive integration of pedagogical clinical knowledge and reflective thinking should reveal a movement along the continuum proposed by Perry (1970), as they are exposed to both the theoretical and practical aspects of teaching.

Perry conceptualizes critical and ethical development in the undergraduate years as a progression from a reliance upon authority and intuition to a stance which recognizes the need to use critical intelligence in evaluating complexity and multiplicity. During an initial period of development, which Perry calls **Dualism**, students seem to recognize the complexities in teaching, but believe that personal preferences and choices are equally valid. At the second stage, students accept differences, but none are judged to be superior to another. During this stage, which is called **Multiplicity** by Perry, students remain unwilling to change their personal values and beliefs, despite evidence to the contrary. When students begin to perceive knowledge and values as relative to different situations and to recognize that behaviors and attitudes can be critically evaluated on the basis of current knowledge, they have entered Perry's third stage of intellectual growth - **Contextual Relativism**. During the fourth and final stage of Perry's conceptualization, called **Commitment**, students become committed to a personal vision of teaching, based on a critical assessment of the complexity inherent in teaching and learning.

### Cognitive Integration of Reflective Thinking and Pedagogical Knowledge

Shuell (1990) proposed that reflective thinking and knowledge acquisition is a complex process. Intellectual development increases as an individual gradually proceeds through a series of three phases according to Shuell (1990). These phases are not fixed. They tend to change both quantitatively and qualitatively within different knowledge domains. Hence, both level of reflective thinking and quality of clinical knowledge should vary across different pedagogical subjects.

During the first period of development, which Shuell calls the **Initial Phase**, students encounter a large array of facts and pieces of information that are conceptually isolated. Gradually, the students begin to form an intellectual understanding of the attributes of the new domain of knowledge. In the second stage of cognitive growth, students gradually begin to see similarities and relationships among different concepts and principles involved in teaching. During this period, which is called the **Intermediate Phase** by Shuell, reflective thinking competence increases as students' knowledge becomes more abstract and more capable of being generalized to a variety of teaching situations. When students' pedagogical knowledge and reflective thinking become integrated and function more autonomously, they have entered Shuell's third and final stage of intellectual growth-the **Terminal Phase**.

Students begin to depend heavily, if not exclusively, on the pedagogical knowledge-specific strategies for solving problems.

#### Types of Pedagogical Knowledge

Considerable discussion about the nature of pedagogical knowledge was presented in Educating a Profession: The Report of the Bicentennial Commission on Education for the Profession of Teaching (Howsan, Corrigan, Denemark & Nash, 1976). Further constructs of specific forms of pedagogical knowledge were delineated in A Design of a School of Pedagogy (Smith, 1980). Pedagogical clinical knowledge, pedagogical specialized knowledge, and pedagogical academic knowledge were operationalized as the domain of professional practice (Smith, 1980).

Each form of pedagogical knowledge are interrelated with the generic concept of professional pedagogy. However, each is domain specific. Pedagogical clinical knowledge is applicable to all disciplines and across all instructional levels. It includes processes of diagnosis, planning, communication, and evaluation. Specialized pedagogical knowledge is clinical in nature but includes the integration of the psychological, sociological, historical, curricula, technological, and instructional foundations of knowledge. Pedagogical academic knowledge is subject specific. Teachers transform subject matter into a teachable subject consistent with student's diversity.

### Assumptions

First, meaningful intellectual acquisition of pedagogical knowledge is more qualitatively actualized in real school situations. It is reasonable to argue that, prospective teachers' level of pedagogical clinical knowledge and reflective thinking are influenced by the characteristics of the instructional context.

Second, in view of Shuell's (1990) conceptualization of phases of learning it appears that level of pedagogical reflective thinking varies in accordance with the form of pedagogical knowledge domain. It appears that competence in pedagogical clinical knowledge does not suggest equality competence in either pedagogical specialized knowledge or pedagogical academic knowledge.

Third, it was assumed that reflective thinking and pedagogical clinical knowledge are developmental. Both should reveal a reduction in students' reliance upon authority and intuition to a stance which recognizes the need to use critical intelligence in evaluating complexity in teaching. Finally, both reflective thinking and level of pedagogical understanding were assumed to be inferred on the basis of students' verbal behavior (Glatthorn, 1985).

### Hypotheses

#### Hypothesis 1

There is no significant difference between the mean pre and post scores of preservice teachers' field dependent pedagogical clinical knowledge and critical thinking.

### Hypothesis 2

There is no significant pedagogical clinical knowledge and critical thinking difference between the means pre and post scores of high instructional versus moderate instructional emphasis.

### Hypothesis 3

There is no significant difference between the mean pre and post scores of preservice teachers, text-based or field independent pedagogical clinical knowledge and critical thinking.

## **Methodology**

### Sample

Two random samples were drawn from two groups of Afro-American preservice teachers enrolled in an introductory level education course. The combined groups consisted of 183 preservice teachers (145 females and 38 males) enrolled during the fall 1990 and fall 1991 semesters. Sample Group 1 represented students enrolled during the Fall 1990 semester and Sample Group 2, the Fall 1991 Semester. None of students had completed all of the admission requirements for entrance into the teacher education program. All were at the pre-professional stage of the teacher education curriculum.

### Design

A pre-post quasi experimental design was used to examine differences in students' acquisition of selected aspects of clinical knowledge and level of reflective

thinking among the two samples. Students in Sample Group 1, comprised three sections of an Introduction to Education [IEDU] course, each of which was taught by a different instructor. In contrast, students in Group 2 represented two sections of the IEDU course which were taught by the same instructor.

Treatment. Students in Groups 1 and 2 used a common course syllabus with required students to complete ten hours of initial field practicum experience during weeks ten through fifteen of the semester. Students completed a two hour period, during each of the five weeks, with an instructional foci on a) instructional facilities; b) teacher-students interactions; c) teaching roles and styles; d) classroom management and discipline; and e) a tutorial assignment.

Both Group 1 and Group 2 students wrote extensively about selected course content and the field practicum. The writing assignments and oral presentation enabled students to reflect critically about their personal dispositions and preferences with regard to teaching. Group 1 received moderate instruction emphasis on reflective thinking and pedagogical clinical knowledge. In contrast, Group 2, received high instructional emphasis on these topics which included more indept critical analysis of selected assignments.

Instructional emphasis is used, in this study, to denote the level of systematic treatment of reflective

thinking and pedagogical clinical knowledge across three sections of the course. Although, the three Group 1 instructors periodically discussed instructional plans, it was not possible to control extraneous factors which influenced instructional emphasis. Factors effecting instructional emphasis were controlled for Group 2, since one instructor taught both sections of the course. Experimenter bias was controlled by means. Data used in study were collected anonymously and six judges evaluated the data.

#### Procedures

Field Dependent Instruction. Both groups wrote a essay about selected contextual factors adapted from Cole & Griffin (1987). This instrument served to determine the interaction of students' levels of pedagogical clinical knowledge and reflective thinking on field dependent type of instruction. Students were permitted forty minutes in which to respond to the same essay item during the second and final weeks of the course.

For both the pre and post essays, students were provided with a figure which showed several levels of contextual influences on students' learning process (Cole & Griffin, 1987). These contextual factors included: (a) the task concept (b) the learner, (c) the lesson, (d) the classroom organization, (e) the school organization, and (f) the community organization. The test situation required

students to identify and explain how these contextual factors would influence their decisions when teaching a specific lesson to a class of thirty-five students.

Field Independent Instruction. Measures of levels of pedagogical reflection and critical thinking for field independent instruction were determined from students' essays on selected course content. Students' responded to the essay topics after each was discussed in class. The text situation required students to a) summarize and discuss the critical elements of the topic and b) explain how these elements would influence their decisions when teaching. The topics included a) classroom management, b) discipline, c) student diversity, d) effective teaching, e) legal, ethical, and moral issues in teaching, and f) teaching as a profession. Essays written prior to mid semester constituted the pre-test data while those completed after the mid semester served as the post test data. Students wrote the essay in class and were permitted to use their notes on the topic. All essays were limited to a one page response.

Judging Level of Pedagogical Competence. Perry's (1970) first three levels of intellectual development during the college years were used as criteria for rating pedagogical competence. After initial training periods to achieve 80 percent or better interrater reliability, three university instructors and three public school teachers

scored the essays. The essays were rated a score of 1 for dualism, 2 for multiplicity, and 3 for contextual relativism.

Judging Reflective Thinking. The Taxonomy of Educational Objectives: Cognitive Domain I (Bloom, 1956) was used to determine the level of reflective thinking competence illustrated in the students' essays. The team of three instructors and three public school teachers rated the essays for level of reflective thinking two weeks after rating them for level of pedagogical knowledge. The essays were rated a score of 1 for recall; 2 for interpretation; 3 for application; 4 for analysis; 5 for synthesis; and 6 for evaluation.

#### Statistical Analysis

The t-test for correlated means was used to test the three null hypotheses. The t-test for correlated means was used to determine if there is a significant difference between the pre-post means of non-independent samples. The results of the t-test difference between pre and post field dependent levels of pedagogical clinical knowledge (Table 1) are illustrated for both groups of preservice teachers. The purpose here was to determine the interaction of the field practicum experience on the quality of pedagogical clinical knowledge. Comparisons between type of instructional emphasis (Table 2) are contrasted by critical thinking and pedagogical knowledge on field dependent data.

Field independent or text-based pre and post critical thinking and level of pedagogical knowledge are presented in Table 3.

### Findings

#### Field Dependent Pedagogical Clinical Knowledge

In Table 1 the effect of the field dependent instruction on level of pedagogical clinical knowledge is illustrated. The null hypothesis of no significant Table 1

#### Pre and Post Pedagogical Mean Difference and Standard Deviations by Instructional Emphasis

|                                         |          | Pedagogical Clinical Knowledge |     |           |     |        |
|-----------------------------------------|----------|--------------------------------|-----|-----------|-----|--------|
| Instructional Emphasis                  | <u>n</u> | Pre-Test                       |     | Post Test |     | t      |
|                                         |          | M                              | SD  | M         | SD  |        |
| Moderate Instructional Emphasis Group 1 | 40       | 1.4                            | .34 | 1.6       | .40 | 2.02*  |
| High Instructional Emphasis Group 2     | 40       | 1.4                            | .49 | 2.2       | .73 | 4.96** |

\*p < .05. \*\*p < .001.

difference between the mean pre and post level of pedagogical clinical knowledge was rejected. Under moderate instructional emphasis, Group 1 ( $t = 2.02$ ,  $p < .05$ ) versus high instructional emphasis, Group 2 ( $t = 4.96$ ,  $p < .001$ )

there was a significant difference in mean pedagogical clinical knowledge scores.

It appears that field dependent instruction involving the analysis of real school events influence the quality of prospective teachers' initial intellectual development with regards to clinical pedagogical knowledge. The data,  $M=1.4$  and  $SD=.34$  versus  $M=1.4$  and  $SD=.49$ , suggest preservice teachers' level of clinical knowledge were compatible prior to instruction. Both Group 1 and Group 2 students were at the dualism stage according to Perry's (1970) construct of critical and intellectual development. Consequently, both groups seem to recognize some of the contextual factors in real teaching situations, but believed that their personal choices were equally valid.

At the end of the ten hours of initial field practicum experiences combined with critical analysis of real teaching events, both Group 1 and Group 2 had advanced in their intellectual understanding of the clinical pedagogy. Group 1 post scores ( $M=1.6$  and  $SD=.40$ ) indicated that there were some qualitative intra group variance (pre  $SD=.34$  versus post  $S=.40$ ) yet the many of these students' critical knowledge of clinical pedagogy remained at the dualism stage.

In contrast, Group 2 students' scores (pre  $SD=.49$  and post  $SD=.73$ ) indicated greater intro group variance. A greater number of students in Group 2 had reached Perry's second stage of intellectual development, multiplicity. At

this stage students were beginning to recognize a greater need to use critical intelligence in evaluating complexity and multiplicity in teaching events. However, despite knowledge to the contrary these prospective teachers remain unwilling to change their personal values and beliefs.

#### Field Dependent Cognitive Growth

Findings on the relationship between reflective thinking and pedagogical clinical knowledge are presented in Table 2 for both moderate and high instructional emphasis groups. The null hypothesis of no significant difference

Table 2

#### Pre and Post Reflective Thinking and Pedagogical Knowledge Mean Differences and Standard Deviation by Instructional Emphasis

| Instructional Emphasis                   | Field Dependent Instruction |     |     |                       |     |        |
|------------------------------------------|-----------------------------|-----|-----|-----------------------|-----|--------|
|                                          | Reflective Thinking         |     |     | Pedagogical Knowledge |     | t      |
|                                          | <u>n</u>                    | M   | SD  | M                     | SD  |        |
| Moderate Instructional Emphasis- Group 1 |                             |     |     |                       |     |        |
| Pre-Test                                 | 35                          | 1.8 | .39 | 1.5                   | .36 | 2.11** |
| Post-Test                                | 33                          | 2.0 | .36 | 1.7                   | .40 | 4.68** |
| High Instructional Emphasis- Group 2     |                             |     |     |                       |     |        |
| Pre-Test                                 | 38                          | 1.8 | .63 | 1.5                   | .68 | 3.73** |
| Post Test                                | 34                          | 2.5 | .57 | 2.4                   | .63 | 2.42*  |

\*  $p < .05$ . \*\*  $p < .001$ .

between reflective thinking and pedagogical knowledge was rejected. Under moderate instructional emphasis Group 1, both pre-test mean scores ( $t = 2.11$ ,  $p < .001$ ) and post mean scores ( $t = 4.68$ ,  $p < .001$ ) revealed significant differences. These facts suggest that quality of pedagogical knowledge was related to level of reflective thinking for field dependent or real teaching experience based instruction. Similar findings were observed with the high instructional emphasis in Group 2; whereas both pre-test ( $t = 3.73$ ,  $p < .001$ ) and post test ( $t = 2.42$ ,  $p < .05$ .) means were significantly related.

Level of instructional emphasis appeared to have an effect on intellectual growth in both reflective thinking and pedagogical knowledge which support Rosenshine's (1987) findings on explicit teaching. There was greater level of reflective thinking for the high instructional emphasis group (pre-test  $M = 1.8$  and post test  $M = 2.5$ ) versus the moderate instructional emphasis group (pre-test  $M = 1.8$  and post test  $M = 2.0$ ).

Using Bloom's (1956) taxonomy as criteria, both Group 1 ( $M=1.9$ ) and Group 2 ( $M=1.8$ ) pre-test scores were compatible, at the recall level. At this level, each group's reflective thinking was restricted to the identification of specific concepts and principles in teaching without regard to their relevance to the teaching process. In contrast, the post test scores (Group 1,  $M=2.0$  and Group 2,  $M=2.5$ ) indicate that both groups had reached the second level,

comprehension. Group 2 demonstrated greater reflective thinking relative to the interpretation of specific concepts and principles in teaching.

For level of pedagogical knowledge pre-test scores (Group 1,  $M = 1.5$  and Group 2,  $M = 1.5$ ) illustrated cognitive integration of specific concepts and principles of teaching at the dualism stage. As anticipated, both groups conceptualized diversity in teaching as an either/or situation with limited personal understanding and participation. As indicated by the post test scores (Group 1,  $M = 1.7$  and Group 2,  $M = 2.4$ ), both groups advanced in level of understanding in clinical knowledge (Table 2). Group 1 students remained at the dualism stage; whereas Group 2 students proceeded to the mid point of stage two, multiplicity. At this level, Group 2 began to recognize, to a greater extent, the interrelatedness among the concepts and principles in teaching. Yet their personal biases remained unchanged.

#### Field Independent Cognitive Growth

The null hypothesis of the pre-post difference field independent or text-based instruction was not supported (Table 3) conclusively. For reflective thinking, mean score difference was significant for the content concerning effective teachers ( $t = 5.54$ ,  $p < .001$ ); whereas classroom management ( $t = 1.03$ ) was not significant.

Table 3

Pre and Post Field Dependent Reflective Thinking and  
Pedagogical Knowledge Differences and Standard Deviations  
by Instructional Content

|                          |          | Field Independent |     |      |     |        |  |
|--------------------------|----------|-------------------|-----|------|-----|--------|--|
| Instructional<br>Content | <u>n</u> | Pre               |     | Post |     | t      |  |
|                          |          | M                 | SD  | M    | SD  |        |  |
| Reflective Thinking      |          |                   |     |      |     |        |  |
| Effective Teachers       | 33       | 1.4               | .28 | 1.8  | .41 | 5.54** |  |
| Classroom Management     | 31       | 1.6               | .35 | 1.8  | .39 | 1.03   |  |
| Pedagogical Knowledge    |          |                   |     |      |     |        |  |
| Effective Teachers       | 33       | 1.7               | .81 | 2.3  | .88 | 3.77** |  |
| Classroom Management     | 31       | 1.6               | .76 | 2.0  | .89 | 2.36*  |  |

\*p < .05.    \*\*p < .001.

These findings support the assumption that most reasoning is domain-specific and most knowledge is context-bound (Bereiter, 1990; Rumelhart & Norman, 1981). There was pre-test reflective thinking differences (Effective Teachers, M = 1.4, SD = .28 and Classroom Management, M = 1.6, SD = .35) indicating that cognitive growth at the recall level was slightly higher for classroom management with greater group heterogeneity. As a consequence of text-based instruction, cognitive growth increased as indicated by the post test scores for both

Effective Teachers,  $M = 1.8$ ,  $SD = .41$  and Classroom Management,  $M = 1.8$ ,  $SD = .39$ ). However, quality of reflective thinking remained at the recall level suggesting that students were able to identify specific attributes of these concepts without any significant interpretation within the teaching process.

In support of Shuell's (1990) phrases of learning theory, pedagogical cognitive development seemed to vary with the specific content domain. As evidenced by the pedagogical knowledge pre-test scores (Effective Teachers,  $M = 1.7$ ,  $SD = .81$  and Classroom Management,  $M = 1.6$ ,  $SD = .76$ ) students differed slightly in their understanding of these content areas (Table 3). However, irrespective to the two specific types of content, students' quality of pedagogical knowledge was based primarily on their personal preferences. This observation was expected since we know that students entering teacher education have definite ideas about teaching and learning (Brousseau, Book, & Byers, 1988; Day, 1959; Fuller & Brown, 1975; Lortie, 1975; Wright & Tuska, 1968), which tend to become resistant to alternative cognitive and behavioral change.

The pre-post findings shown in Table 3 (Effective Teachers,  $t = 3.77$ ,  $p < .001$  and Classroom Management,  $t = 2.36$ ,  $p < .05$ .) for clinical pedagogical knowledge rejects the null hypothesis of no significant difference in field independent or text based instruction on level of intellectual development. There was minimal pre-test level

of intellectual difference among students between Effective Teachers ( $M = 1.7$ ,  $SD = .81$ ) and Classroom Management ( $M = 1.6$ ,  $SD = .76$ ). These mean scores indicated pedagogical knowledge comprehension at the dualism stage of Perry's (1970) theoretical construct of intellectual development. At this level, students evaluated each content area in terms of their personal knowledge and beliefs rather than on the basis of research evidence.

On both content areas, (Table 3) students' cognitive integration of clinical pedagogical knowledge increased as indicated by the post-test scores (Effective Teachers,  $M = 2.3$ ,  $SD = .88$  and Classroom Management,  $M = 2.0$ ,  $SD = .89$ ). Students had advanced to the second level of intellectual development, multiplicity. Students had begun to recognize more of the complexities involved with effective teaching and classroom management. They acknowledged the validity of the effective teaching and classroom management research in professional practice. However, at this level of intellectual development, these students believed that their personal knowledge about effective teaching and classroom management was equally legitimate as a basis for professional decisionmaking in teaching. Moreover, students' understanding of these subjects was limited to specific situations as opposed to the relevance of knowledge across multiple situations.

### Conclusions

This study represented a beginning effort to examine the assumption advanced by the multisource learning theory using Schon's (1987) constructs of field dependent or real-world versus field independent or text-driven modes of instruction. It was argued that level of pedagogical clinical knowledge and reflective thinking among prospective Afro-American teachers differed with not only mode of instruction but level of instructional emphasis as well. On the basis of Perry's (1970) proposal of intellectual development, we assumed that the cognitive integration of pedagogical clinical knowledge would reveal qualitative differences under real classroom teaching experiences versus text-driven instruction. Finally, we argued, using Shuell's (1990) phases of learning theory, that cognitive integration of clinical pedagogical knowledge and level of reflective thinking were influenced by subject content.

The findings supported the observation that field dependent instruction involving the analysis of real school events qualitatively influenced prospective teachers' initial cognitive integration of clinical pedagogical knowledge. Students advanced along the continuum of Perry's (1970) first and second stages of intellectual development, dualism and multiplicity respectively. Students gained a greater understanding of the contextual factors involved in teaching, yet continued to value their own personal knowledge and beliefs.

A positive relationship between reflective thinking and cognitive integration of pedagogical clinical knowledge was confirmed irrespective of level of instructional emphasis (moderate versus high). However, level of instructional emphasis seemed to have had a qualitative effect on both reflective thinking and pedagogical clinical knowledge. Greater gains were in favor of the high instructional emphasis group (Group 2). For Group 2, reflective thinking advanced from recall to comprehension and from dualism to multiplicity for pedagogical clinical knowledge.

The data on field independent or text-driven instruction confirmed the supposition regarding qualitative differences in cognitive integration of clinical pedagogical knowledge and level of reflective thinking. On both subjects, effective teachers and classroom management, cognitive growth was greater in pedagogical knowledge in contrast to reflective thinking. For pedagogical knowledge, students showed greater growth in effective teaching than in classroom management. This fact supports Shuell's (1990) argument that most reasoning is domain-specific and most knowledge is context-bound yet phases of cognitive growth are not fixed. Consequently, the existence of a uniformity of prospective teachers' cognitive development may not be assumed across all pedagogical subjects.

Though obviously limited by the single program studied,

the composition and size of the sample, and the level of field practicum experience, this study suggests that reflective thinking and pedagogical clinical knowledge are essential factors to be considered in the professional education of beginning prospective teachers. Given appropriate instruction using real-world teaching experiences, Afro-American prospective teachers will achieve a meaningful cognitive integration of the complexities involved in teaching.

It is not a question of simply text-driven versus real-world based instruction. It is necessary to critically reconceptualize the quality of preservice cognitive development under different assumptions about the nature of learning. Clearly, this study implies that what seems to be needed in teacher education is a more wholistic and flexible approach that will help teacher candidates to achieve a more meaningful, versus a superficial, understanding of teaching. We have argued that an understanding of the prospective teacher's unique cultural, metacognitive, and individual preferences must be considered as critical factors in the professional preparation of prospective teachers.

Research must go beyond this study to investigate the relationship of reflective thinking and clinical pedagogical knowledge as prospective teachers advance through the teacher education program. Assumptions about prospective teachers' cognitive integration of different types of

pedagogical knowledge should be reexamined on the basis of qualitative changes in their unique cognitive schema of the professional practice.

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